

Fort Hall, Idaho Ter., Camp McDermitt, Nev., Yuma and Fort Griffin, Texas. Those recording less than one-tenth (0.1) of an inch are: San Francisco, .01; Andover, Mass., .03; West Point, N. Y., .05; San Diego, Coalville, Utah, and Rio Grande, Texas, .06; Standish, Me., .07, and Carson City, Nev., .08 inches. At Caperville, Va., 4.70 inches of rain is reported to have fallen on the 29th, and at Fort McKavett, Texas, 3.24 inches during the night of the 9th and 10th.

*Snow-fall.*—Light snow fell at Virginia City on the morning of the 9th, on Mt. Washington early during the morning of the 23rd, and on Pike's Peak on the 3rd, 4th, 6th, 13th, 20th, 26th, 27th and 30th. Heavy snow on Pike's Peak on the 18th, 19th and 31st.

*Hail.*—1st, heavy on Pike's Peak; 2nd, at Dubuque, and large at Galveston; 6th, at Vevay, Ind., and heavy on Pike's Peak; 7th, at Honesdale, Penn.; 8th, at Pembina and on Pike's Peak; 9th, at Alto Vista, Va., Atlanta, Ga., and on Pike's Peak; 13th, at Spartanburg, S. C.; 15th, track three miles wide and six long, destroying fruits, vegetables, &c., between Wappinger's Falls and Poughkeepsie, N. Y.; 16th, at North Platte; 17th, Pike's Peak and Pembina; 19th, Le Roy, Kan.; 20th, Pike's Peak; 21st, Denver; 28th, violent at Kanab, Utah; 29th, between Pembina and Fort Garry, track three miles wide, and stones from one to seven inches in circumference; 30th, Pike's Peak; 31st, heavy at Alpena and on Pike's Peak.

*Cloudy Days.*—The number of cloudy days, as reported by the volunteer observers, ranges as follows in the various districts: New England, 0 to 7; Middle States, 0 to 11; South Atlantic States, 1 to 9; Eastern Gulf States, 3 to 9; Western Gulf States, 0 to 5; Arkansas, Tennessee and the Ohio valley, 3 to 13; Lake region, 0 to 9; Northwest, 0 to 11.

*Rainy Days.*—The number of days on which a greater or less quantity of rain fell averages as follows: New England, New York and northern Pennsylvania, 4; South Atlantic and southern portion of the Middle States, 12; Ohio valley, Tennessee and Eastern Gulf States, 15; Western Gulf States, Upper Lake region and western portion of Lake Erie; 11; Northwest, 12.

*Droughts.*—Fla.: Mayport, ground very dry, season unusually sickly. Ill.: Riley, rain needed 23d. Maine: Standish reports drought very severe, streams dry and wells low; West Waterville, driest August ever recorded. New Hampshire: Plaistow, during the month rain upon one day only; Shelburne, very severe, and water scarce; Auburn and Contoocookville, very severe, springs and wells failing. Vermont: reports from all stations show the month to have been exceedingly dry, and crops damaged in some sections. Massachusetts: Amherst, vegetation scorched; Mendon, streams and wells low. New York: Ardenia, corn, potatoes and gardens destroyed, springs and streams low; Albany, severe during almost the entire month; Brookhaven, severe; Elmira, severely felt; Essex county, no rain for weeks, country very dry, and much vegetation destroyed; Flushing, 20th to close of month; Kenisco, gardens destroyed; Malone, severe, no rain for four weeks; Nichols, corn and buckwheat damaged; Pine Plains, crops of all kinds damaged; Port Jervis, very severe, most streams and ponds nearly dry, and no rain since June 30th; St. Lawrence county, very severe, farmers feeding grain to cattle to prevent starvation; Starkey, month dry, no great damage; Wappinger's Falls, long and severe, from July 31st to August 31st, and at close of month not enough water in streams to run factories. New Jersey: Freehold, very severe; Newark, month dry, fruits suffering; New Germantown, month dry, vegetation suffered very much; Vineland, ground dry at close of month. Pennsylvania: Blooming Grove, only one-tenth of an inch of rain; Erie, vegetation suffering greatly; York Sulphur Springs, a narrow region eight or ten miles long, and from five to eight in width during most part of summer almost destitute of rain, while the adjoining country on all sides enjoyed a favorable agricultural season; Tioga, streams very low, probably the driest period in 80 years. Tennessee: local droughts reported in the eastern portion. Virginia: Wytheville, from the 18th. Michigan: Litchfield, gardens injured. Texas: Corsicana, cotton crop greatly injured, and stock suffering for want of water.

*Floods.*—not mentioned above, near Wytheville, Va., about the 1st, sweeping away hay, fencing, &c.; 8th, at Logansport, Ind., a very heavy rain, flooding streets, cellars, &c.; 17th, at Fort Sully, heaviest rain-storm ever known, and on the opposite side of the river the water draining from a canon is reported to have moved out in a solid bank 3 feet deep and 200 feet wide; 26th, near Hay's City, Kan., a water-spout burst over Kill creek, causing destructive floods, and in the mountains east and west of Kanab, Utah, floods damaged roads and ditches; 28th, at Neillsville, Wis., heavy rain, damaging railroads; 31st, on Chalk creek, five miles from Coalville, Utah, a "cloud-burst" was reported, and a solid bank of water, between three and four feet high, came down the stream, destroying dams, &c.

## RELATIVE HUMIDITY.

The average relative humidity for the month ranges, at the Atlantic coast stations, from 72 to 79 per cent.; in the interior of New York and New England, 59 to 69; in Maryland, Virginia and the South Atlantic States, 69 to 75; in the Gulf States and Tennessee, 69 to 78; in the Lake region and Ohio valley, 62 to 78; in the Upper Mississippi and Lower Missouri valleys and Minnesota, 68 to 74; on the plains of Kansas, Nebraska and Dakota, 59 to 64; at the Rocky Mountain stations, 29 to 68; and on the Pacific coast, 64 to 74. *Moist stations:* Atlantic City and Thatcher's Island, average, 79 per cent.; Mobile, 78; St. Marks, Knoxville, Pembina and Cairo, 77; Memphis, Tybee Island, Cape Hatteras, Cape May, Barnegat

and Mt. Washington, 76. *Dry stations.* Salt Lake City, averages 29 per cent.; Cheyenne, 38; Virginia City, 41; Denver, 42; Bismarck, North Platte and Malone, 59; Fort Sully and Albany, 61; Rochester, 62; Buffalo, 63; Dodge City and New York, 64.

## WINDS.

*Prevailing Winds.*—The points of the compass from which the winds have blown most frequently during the month will be seen by examining chart No. II, the arrows flying with the wind. At Campo, Cal., the prevailing winds have been from the W.; Yuma, S.; Bismarck, NW.; Fort Sully, SE.; Smithville, N. C., SW.; Kitty Hawk, N. C., E.; Sandy Hook, SE.; Barnegat, E.; Atlantic City, NE.; Thatcher's Island, SW.

The *maximum velocities* are given in the description of the movements of the low-pressure areas. On the summit of Mt. Washington the highest velocities occurred on the 21st and 22nd, and on Pike's Peak on the 22nd.

*Total Movements.*—The largest total movements of the air during the month, independent of direction, have been recorded at the following stations, viz: Breckenridge, 11,323 miles; North Platte, 11,239; Fort Dodge, 11,196; Pike's Peak, 9,635; Cape May, 8,886; San Francisco, 8,790; Barnegat, 8,511; Fort Sully, 8,476; Sandy Hook, 8,140; Indianola, 7,910; Cheyenne, 7,870; Cape Lookout, 7,851. It has been impossible to obtain a continuous record on Mt. Washington. The smallest movements have occurred at Lynchburg, 1,807 miles; Savannah, 1,963; Augusta, 2,129; Louisville, 2,172; Morgantown, 2,208; Nashville, 2,279; Vicksburg, 2,302; Shreveport, 2,701; Memphis, 2,769; Springfield, 2,790; Savannah, 2,855; New London, 2,985; Cincinnati, 2,898.

## VERIFICATIONS.

*Probabilities.*—As worked up three times daily and issued to the public, they have been carefully compared with the actual conditions during the succeeding twenty-four hours, and the following result obtained. The percentage of verifications has averaged 86.13 for New England, 86.83 for the Middle States, 88.23 for the South Atlantic States, 87.68 for the Eastern Gulf States, 88.91 for the Western Gulf States, 86.52 for Tennessee and the Ohio valley, 88.60 for the Lower Lake region, 90.20 for the Upper Lake region, 86.99 for the Upper Mississippi valley, and 82.44 for the Lower Missouri valley. The average for the whole country is 87.25 per cent. For the weather, 85.88; wind direction, 92.33; temperature, 88.62; barometric changes, 82.20 per cent. have been obtained. There were four omissions to predict out of 3,720, or 0.1 per cent.

*Cautionary Signals.*—During the month fifty-two (52) signals were ordered to be displayed at the different stations along the South Atlantic and Middle Atlantic coasts, and the Lakes. Of these, one (1) was ordered late, thirty-four (34) have been reported as justified, and seventeen (17) not justified. Warnings were sent for two Canadian stations, along Lake Huron, on the 10th, but are believed to have been not justified. Thirty-four (34) cases have been reported, from scattered stations, where the wind-velocity reached twenty-five (25) miles, and over, per hour without the display of Signals, viz,—on the 1st, Cape Henry, N. E., 36 miles; Kittyhawk, E., 28; Cape Hatteras, S., 34; 2nd, Galveston, N. W., 29; Indianola, N., 44; 3rd, Mobile, S., 30; 6th, Key West, E., 25; 7th, St. Marks, S. W., 26, (squall); 8th, Marquette, S., 30; 10th, Key West, E., 30; Cape Lookout, N. W., 26; 12th, Savannah, E., 40; 13th, Indianola, S., 27; 14th, Escanaba, N., 28; 18th, Cape Lookout, W., 30; 19th, Escanaba, N., 32; 20th, Sandy Hook, N., 32; Boston, N. W., 32; Thatcher's Island, N. W., 28; Portland, Me., N. W., 28; Port Huron, N. E., 25; 21st, Mobile, S. E., 29; Cape Lookout, N. E., 28; Cape Hatteras, N. E., 26; 22d, Boston, W., 26; 24th, Mobile, S. E., 28; 26th, Buffalo, W., 26; Alpena, NW., 28; 27th, Kittyhawk and Cape Hatteras, NE., 28; Cape May, N., 32; Sandy Hook, N. W., 29; Portland, Me., N. W., 26; 31st, Alpena, N. W., 28. In a great many cases they occurred during local thunder-storms, and were of short duration.

## NAVIGATION.

*Height of Rivers.*—Upon chart No. III is printed a table giving the highest and lowest marks, with the dates upon which they occurred. In the Red river there has been a steady decline at Shreveport during the month, excepting a temporary rise of thirty inches on the 11th. The Missouri fell slowly at Fort Sully up to the middle of the month; after a sudden rise of one foot, it continued slowly falling till the 27th, then rose to its maximum on the 29th. At Yankton and Omaha it changed but slightly until reaching its maximum, after which the fall was quite regular until the minimum was reached, when a rise of a few inches closed the month. At Leavenworth it fell quite regularly up to the 20th; after a rise of one foot on the 21st, its decline was steady. The upper Mississippi continued quite low throughout the month. At Keokuk navigation was greatly impeded. At St. Louis, after falling steadily and reaching its minimum, it rose to 14 feet 4 inches on the 27th, and then continued slowly falling. The lower Mississippi fell quite steadily throughout the month, excepting slight rises at Cairo on the 13th and 24th, and at Memphis on the 17th and 26th. An immense sand-bar formed during the first week at the lower side of the "cut-off" below